

CLAIMS

What is claimed is:

1. A method of providing digital watermarking of a digital media containing predetermined digital content, comprising the steps of:

extracting at least one feature from said digital content;

constructing a first watermark component from said extracted feature;

constructing a second watermark component from said extracted feature;

embedding said first watermark component within said second watermark component to define a dual component watermark; and

embedding said dual component watermark in said digital content.

2. The method of claim 1 wherein said first watermark component is constructed by performing a hashing operation on said extracted feature.

3. The method of claim 1 wherein said second watermark component is constructed by performing a hashing operation on said extracted feature.

4. The method of claim 1 wherein said second watermark component is constructed by performing a hashing operation on said extracted feature and then encrypting the hashing operation result.

5. The method of claim 4 wherein said encrypting step is performed using the private key of a public key encryption process.

6. The method of claim 1 wherein digital content is digital video content and said feature extracting step is performed by obtaining an intensity value associated with at least one pixel of said digital video content.

7. The method of claim 1 wherein said digital content is digital video content organized as blocks containing a predetermined number of pixels and wherein said feature extracting step is performed by calculating the mean intensity value associated with a block of said digital video content.

8. The method of claim 1 wherein said digital content is MPEG video content organized as frames that include an intra-coded frame and wherein said feature extracting step is performed by extracting at least one feature from said intra-coded frame.

9. The method of claim 1 wherein said digital content is MPEG video content organized to include group-of-pictures information and wherein said feature extracting step is performed by extracting at least one feature from said group-of-pictures information.

10. The method of claim 1 said digital content is MPEG video content organized as frames that include an intra-coded frame and wherein said dual component watermark is embedded in said intra-coded frame.

11. The method of claim 1 wherein said first watermark component is embedded within said second watermark component using a block-based spread spectrum technique.

12. The method of claim 1 wherein said digital content is MPEG video content organized into groups and wherein said first watermark component contains group index information to detect temporal jittering.

13. The method of claim 1 wherein said second watermark component includes time code information to detect temporal jittering.

14. The method of claim 1 wherein said digital content is MPEG video content organized into frames, groups and blocks and wherein said first watermark component includes frame level, block level and group level information.

15. The method of claim 1 further comprising using said dual component watermark to classify attacks to said digital content according to multiple categories.

16. The method of claim 15 wherein one of said multiple categories is temporal jittering.

17. The method of claim 15 wherein one of said multiple categories is content modification.

18. The method of claim 15 wherein one of said multiple categories is counterfeiting attack.